

Chapter 6

DEMAND ESTIMATES AND PROJECTIONS

Demand assessments for 1990 and projections for 2010 were made for five categories of water use. The category of *public water supply* refers to all potable water supplied by regional water treatment facilities with pumpage greater than 500,000 gallons per day (GPD) to all types of customers, not just residential. The other four categories of water use are self supplied. *Commercial and industrial* refers to operations using over 100,000 GPD. *Recreation self supplied* includes landscape and golf course irrigation demand. The landscape subcategory includes water used for parks, cemeteries and other irrigation applications greater than 100,000 GPD. The golf course subcategory includes those operations not supplied by a public water supply or regional reuse facility. *Residential self supplied* is used to designate only those households whose primary source of water are private wells. *Agriculture* includes water used to irrigate all crops, and for cattle watering. For 1990, the total assessed water demand for the UEC Planning Area was 154,279 million gallons for the year (Figure 16).

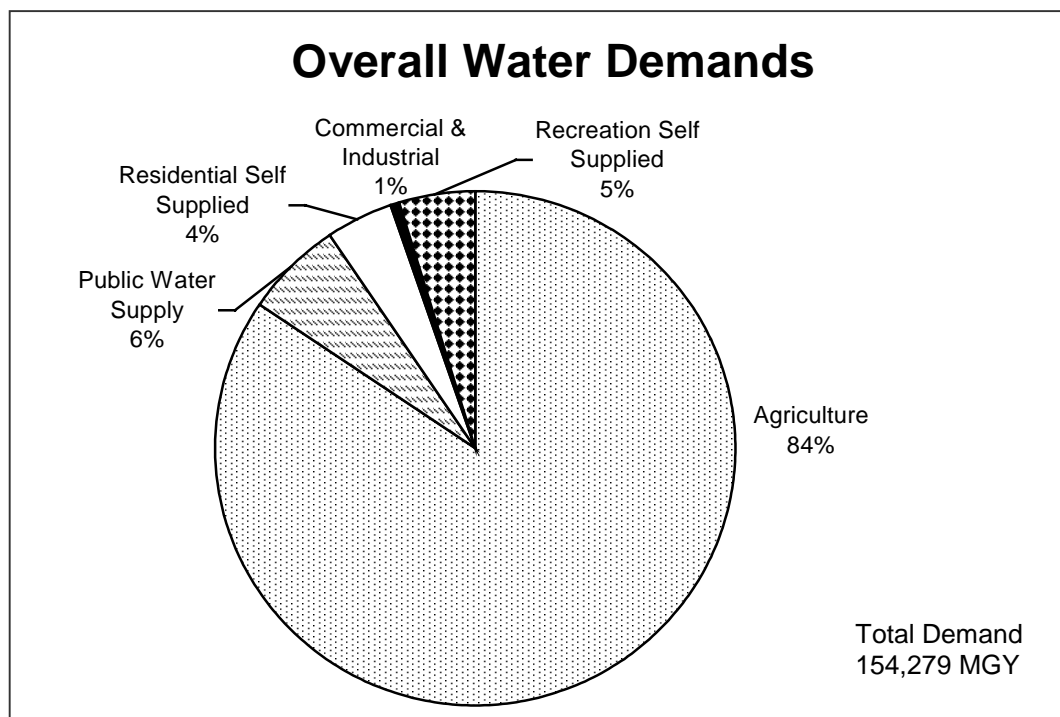


Figure 16. Overall Water Demands for 1990 in the UEC Planning Area.

From 1990 to 2010, the total water demand is projected to increase by 34 percent from 154,279 to 206,255 million gallons per year (MGY), as shown in Table 13 and Figure 17. Public water supply has the largest projected increase of 143 percent. However, agricultural water demand is projected to remain the single largest category of use. In 1990, agriculture accounted for 84 percent of the total demand. Agricultural demands are projected to increase by 23 percent by 2010, accounting for 78 percent of the total demand in that year.

Table 13. Overall Water Demands for 1990 and 2010 (MGY).

Category	Estimated Demands 1990	Projected Demands 2010	% Change 1990-2010
Agriculture	130,191	160,528	23
Public Water Supply	9,607	23,371	143
Residential Self Supplied	6,398	6,876	7
Commercial & Industrial	850	1,570	85
Recreation Self Supplied	7,233	13,910	92
Total	154,279	206,255	34

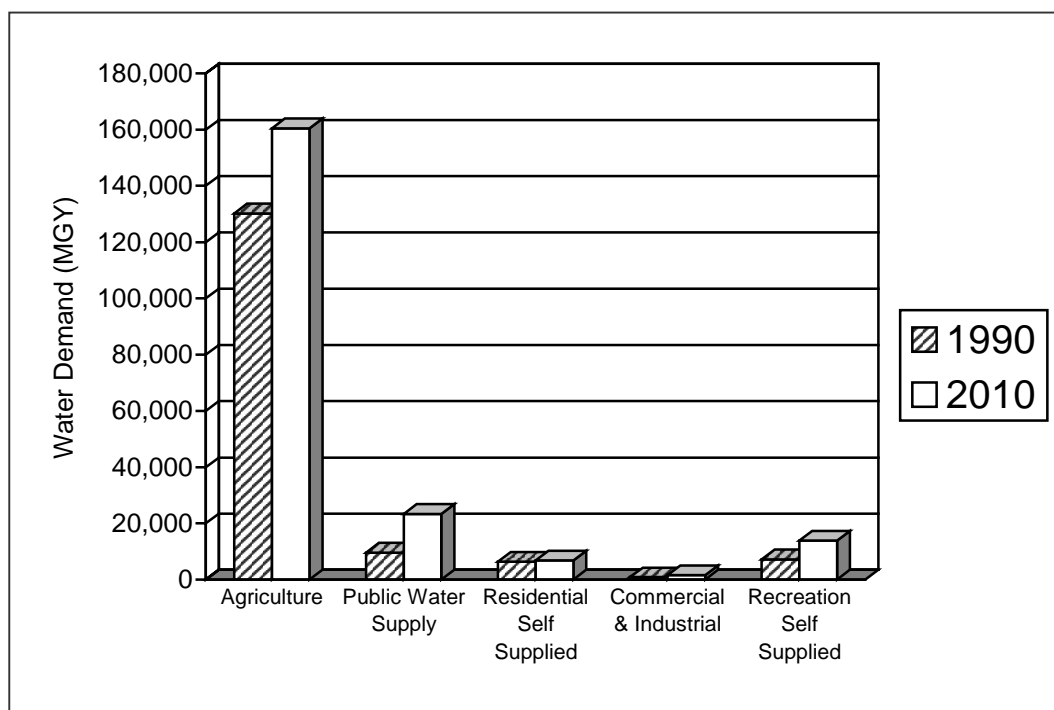


Figure 17. Comparison of 1990 and 2010 Water Demands (MGY).

URBAN WATER DEMAND

Urban water demand includes: (1) public water supply (PWS) provided by utilities; (2) residential self supplied (RSS); (3) commercial and industrial self supplied; and (4) recreation self supplied. Public water supply was the largest component (40%) of urban water demand in 1990, followed by recreation self supplied (30%), residential self supply (27%), and commercial and industrial self supply (4%). Urban water demand in 1990 was estimated to be about 24 billion gallons per year and is projected to increase to almost 46 billion gallons per year in 2010.

The driving force behind urban demand is population. Population numbers for 1990 were taken from the U.S. Census. Population projections for the year 2010 were obtained from the county and local government comprehensive plans, derived for the portions of the counties within the planning area (Table 14), and used to develop urban demand projections. The total population of the planning area for 1990 was 252,086, and is projected to increase 77 percent to 445,925 in 2010.

Table 14. Population in the UEC Planning Area, 1990-2010.

Region	1990			2010		
	Total	PWS	RSS	Total	PWS	RSS
St. Lucie Area	150,171	86,808	63,364	290,100	221,320	68,780
Martin Area	100,900	54,935	45,965	154,200	101,520	52,680
Okeechobee Area	1,015	0	1,015	1,625	0	1,625
Total Planning Area	252,086	141,743	110,344	445,925	322,840	123,085

Source: Local Government Comprehensive Plans, and U.S. Bureau of the Census, 1990.

Urban demand is projected for the St. Lucie and Martin areas. The Okeechobee Area is not included in the urban water demand analysis because the portion of the county within the UEC Planning Area has very small demands for urban uses.

Public Water Supply and Residential Self Supplied

The estimated water demand for PWS and residential self supplied users was 44 million gallons per day (MGD) in 1990. These water demands are projected to increase 89 percent from 1990 to 2010 to a total water demand of 83 MGD (Table 15). About 44 percent of the 1990 population were self supplied and this is projected to be 28 percent in 2010. More specific information on utility service area populations and water demands, as well as the methodology used to develop these values is provided in Appendix G.

Table 15. Public Water Supply and Residential Self-Supplied Demand (MGD).

County Area	1990		2010	
	Public Water Supplied	Residential Self Supplied	Public Water Supplied	Residential Self Supplied
St. Lucie Area	13.58	8.85	39.67	9.32
Okeechobee Area	0.00	0.12	0.00	0.20
Martin Area	12.74	8.56	24.36	9.32
Total	26.32	17.53	64.03	18.84

Commercial and Industrial Self Supplied

Commercial and industrial demands supplied by public utilities are included in the PWS demands. The Martin Area has the highest self-supplied demands (Table 16). The projection methodology for commercial and industrial self-supplied demand is discussed in Appendix G.

Table 16. Commercial and Industrial Self-Supplied Demand (MGD).

County Area	1985	1990	1995	2000	2005	2010
St. Lucie Area	0.11	0.81	1.00	1.19	1.37	1.56
Martin Area	1.28	1.52	1.81	2.10	2.40	2.74
Total	1.39	2.33	2.81	3.29	3.77	4.30

Recreation Self Supplied

Recreation demands supplied by PWS utilities are included in the PWS demands. Recreation self-supplied demands include withdrawals for landscape and golf course irrigation.

Landscape

Demand projections for this section include irrigated acreage permitted for landscaping and recreation in the St. Lucie and Martin areas, excluding golf courses. The St. Lucie Area has the highest demands (Table 17). Projection methodology is discussed in Appendix G.

Table 17. Landscape Self-Supplied Demand (MGD).

County Area	1985	1990	1995	2000	2005	2010
St. Lucie Area	2.76	3.98	4.89	5.80	6.71	7.62
Martin Area	0.27	1.87	2.23	2.60	2.96	3.38
Total	3.03	5.85	7.12	8.40	9.67	11.00

Golf Course

Golf course self-supplied demand was 13.96 MGD in 1990, and is projected to increase to 27.11 in 2010 (Table 18). Descriptions of the golf courses in the St. Lucie and Martin areas, projection methodology, and the calculation of irrigation requirements are provided in Appendix G.

Table 18. Golf Course Self-Supplied Demand (MGD).

County Area	1985	1990	1995	2000	2005	2010
St. Lucie Area	3.17	3.58	4.88	5.90	6.92	7.94
Martin Area	8.39	10.38	12.11	14.39	16.74	19.17
Total	11.56	13.96	16.99	20.29	23.66	27.11

AGRICULTURAL WATER DEMAND

Summary of Agricultural Demand

There are eight categories of agricultural water demand analyzed in this section: (1) citrus; (2) sugarcane; (3) vegetables; (4) sod; (5) cut flowers; (6) ornamental nursery; (7) improved pasture; and (8) cattle watering. Agricultural water demand was estimated for 1990 to be approximately 130 billion gallons. Citrus was by far the largest 1990 agricultural water demand (82%) and is followed by sugarcane (11%). Vegetables, sod, cut flowers and ornamental nurseries combined account for about three percent of the total agricultural demand. The combined water demand for cattle watering and irrigation of improved pasture also account for about three percent.

Agricultural water demand is forecast to increase by 23 percent to 161 billion gallons per year in the year 2010. Approximately 95 percent of the agricultural water

demand in the year 2010 is anticipated to be for citrus (85%) and sugarcane (10%). Vegetables, sod and ornamental nurseries are each projected to represent about one percent of the total 2010 agricultural water demand.

The UEC Planning Area continues to experience growth in irrigated agricultural acreage, especially citrus. The irrigated crops in this region are citrus, sugarcane, vegetables, sod, cut flowers and ornamental nursery. Growth in citrus acreage is usually on land that was formerly pasture. Except for 10,000 acres, pasture is seldom irrigated in the planning area. When irrigation does take place it is invariably in a period of extreme drought, and is done to prevent the grass from dying. There are, however, some requirements for cattle watering associated with the total pasture acreage. Descriptions of the agricultural acreage in each county, projection methodology, and the calculation of irrigation requirements, including data sources, are detailed in Appendix G.

Agricultural irrigation requirements are seasonal, especially for crops such as vegetables which are grown only at specific times of the year. Therefore, agricultural requirements are presented by month for each crop in each county, and the summations for the planning area are presented as million gallons per year.

Table 19 shows the annual average agricultural irrigation demand by crop. Figure 18 presents a graphical comparison of agricultural demand by crop type for 1990 and 2010.

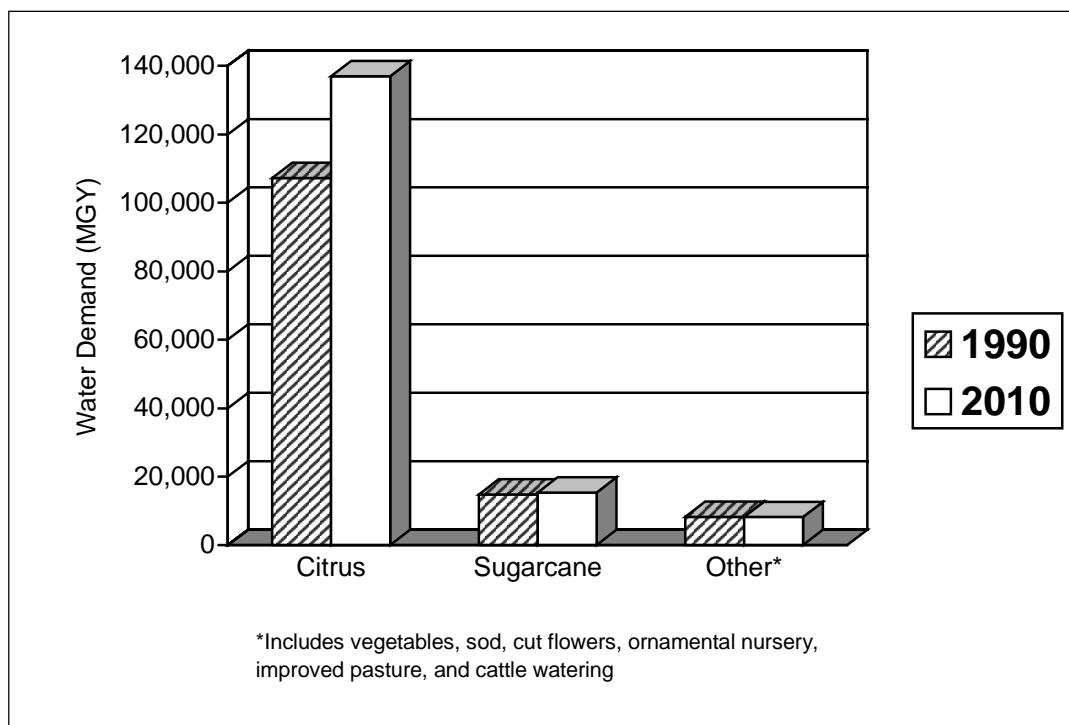
Citrus

Citrus is by far the dominant agricultural crop in the planning area, and occupies over four-fifths of the irrigated agricultural acreage in the region. Between 1968 and 1980 acreage remained at about the same level. Since 1980, acreage has grown moderately but continuously, and is associated with the interregional movement of citrus acreage southward from central Florida following several severe winter freezes in the mid-1980s.

Citrus acreage in the planning area is projected to grow from 143,621 acres in 1990 to 185,873 acres in 2010. This growth in acreage represents an increase in average irrigation requirements from 107,195 MGY in 1990 to 137,004 MGY in 2010. The 2010 projected citrus acreage equaled the 1995 total permitted irrigated citrus acreage.

Table 19. Water Demand and Irrigated Acreage by Crop (MGY).

Category	Estimated Demands 1990	Total Irrigated Acreage 1990	Projected Demands 2010	Total Irrigated Acreage 2010	% Change in Demands 1990-2010	% Change in Acreage 1990-2010
Citrus	107,195	134,133	137,004	176,385	28	32
Sugarcane	14,744	13,433	15,335	13,952	4	4
Vegetables	1,731	2,401	1,731	2,401	0	0
Sod	1,599	960	1,599	960	0	0
Cut Flowers	38	40	38	40	0	0
Ornamental Nursery	1,015	597	988	929	-3	56
Improved Pasture	2,671	10,000	2,671	10,000	0	0
Cattle Watering	2,671	---	1,179	---	-3	---
Total Planning Area	130,191	161,564	160,528	204,667	23	27

**Figure 18.** Comparison of 1990 and 2010 Agricultural Demands (MGY).

Sugarcane

Martin County is the only part of the planning area where sugarcane is produced. In 1990, there were 13,433 acres of production. Sugarcane acreage is projected at 13,952 acres for future time horizons, which is the average production for the seven years of production from 1986 through 1992. As a result of the cultivation practices used for sugarcane (ratoon and fallow), 20 percent of the land used for sugarcane production is idle in any given year. This idle land does not require irrigation and is not included in the demand projections presented here. The 1990 production of 13,433 acres has associated average irrigation requirements of 14,744 MGY in 1990 and this is projected to grow to 13,952 acres with an irrigation requirement of 15,335 MGY in 2010.

Vegetables

Vegetable crops grown in the planning area include cabbage, zucchini, potatoes, tomatoes, cucumbers, snap beans, peppers, Chinese vegetables, squash, sweet corn, eggplant, and strawberries. Different types of vegetables are often grown interchangeably. In 1990, there were 2,401 acres of land used for vegetable production. This is projected to remain at the same level through 2010, and represents an average irrigation requirement of 1,731 MGY.

Sod

In 1990, there were a total of 960 acres of irrigated sod production in the planning area. There is additional sod harvested from pasture land, but this is rarely irrigated. Sod production is projected to remain fairly constant through 2010, with an associated average irrigation requirement of 1,599 MGY.

Cut Flowers

Martin is the only county in the planning area with cut flower acreage, and this is forecasted to remain at about 40 acres through 2010. The associated average irrigation requirement is 38 MGY.

Ornamental Nursery

In 1990, there were 597 acres of ornamental nursery in the planning area, and this is projected to increase to 929 acres by the year 2010. The District's increased irrigation efficiency requirements for nurseries outweigh the projected growth in

acreage. Average demands by nurseries in the planning area are projected to decrease from 1,015 MGY in 1990 to 988 MGY in 2010.

Improved Pasture

Improved pasture in the planning area is rarely irrigated, with the exception of about 10,000 acres (out of 167,000 total pasture acres) in St. Lucie County. This 10,000 acres has average irrigation requirements of 2,671 MGY and is forecasted to remain at that level throughout the projection period.

Cattle Watering

Demand for cattle watering and barn washing is associated with cattle production (which is in turn associated with pasture acreage). This was assessed at 1,215 MGY in 1990, and is projected to decline slightly to 1,179 MGY in 2010. This decline is related to the displacement of pasture land by citrus.

